NASA
Independent Verification & Validation Facility

Quality Manual

May 25, 2004

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APPROVAL SIGNATURES		DATE
Nelson Keeler (original signature on file)	Director	05/24/2004

REVISION HISTORY			
Rev. No.	Description of Change	Author	Effective Date
Basic	Initial release to replace Ames QM	Siamak Yassini IT/332	09/09/1999
A	Reflect transition to GSFC	Bill Jackson 307/215	05/07/2001
B	Reflect relationship between IV&V and GSFC; reflect deletion of IVV 07 and 08	Greg Blaney 307/387	07/09/2001
C	Reflect changes throughout the entire ISO SLPs, WIs, and documentation processes	Greg Blaney 307/387	03/27/2003
D	Updated process coverage chart and document references.	Greg Blaney 307/387	09/24/2003
E	Updated organizational charts to reflect IV&V's new "Code 100" attachment to Goddard Space Flight Center.	Greg Blaney 180	03/11/2004
F	Updated sections 12.1 and 12.4 (verbiage update), references to NPG to be NPR, and a ref. in sec. 9.1 to 09-4.	Greg Blaney 180	05/25/2004

REFERENCE DOCUMENTS	
Document Number	Document Title
NPG 1441.1	NASA Records Retention Schedule
NPG 1442.1	NASA Uniform Files Index
IVV ALL	All IVV ISO SLPs and WIs
Strategic Plan	IV&V Strategic Plan 2003-2008

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1.0 Preface

The IV&V Facility's vision is "to be recognized as the preeminent organization applying and improving independent verification and validation for software and systems." Our mission is "to ensure that our customer's mission critical software and systems are of the highest quality and are reliable and safe by applying software and systems expertise and tools, while researching new approaches, deploying innovative solutions, providing a learning environment, and participating in the vitality of the community."

Serving our customers is a central purpose of the organization; therefore, it is essential that we consistently meet or exceed our customer' requirements and expectations for the quality, performance, timeliness, and cost of the product and services we provide.

In performing the task, the IV&V Facility works technically independently. We do, however, utilize the Goddard Space Flight Center infrastructure for support functions including personnel, training, and procurement.

This manual defines the IV&V Facility policies that reflect the requirements of ISO 9001:2000, *Quality Management Systems—Requirements*. Implementation of these policies ensures that we will consistently meet the quality and performance requirements of our customer in a timely and cost-effective manner.

I personally affirm my commitment to enhance the IV&V Facility Quality Management System and the maintenance of our ISO 9001 certification. I fully support the provisions of this manual and solicit the active partnership of all IV&V Facility personnel in its implementation. Our success in meeting our customer commitment depends on the service provided by our employees.

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Nelson Keeler, Director, NASA IV&V Facility

2.0 Introduction

2.1 Purpose

This quality manual defines the manner in which the National Aeronautics and Space Administration (NASA) Independent Verification and Validation (IV&V) Facility has implemented a quality system in order to assure our customers the highest quality we here at the NASA IV&V Facility can achieve.

As part of this process we have adopted ISO 9001:2000 as a management systems model and have interpreted its requirements for our organization.

2.2 Scope

The scope of the NASA IV&V Facility ISO 9001 certification includes:

- ***Independent Software Verification and Validation,***
- ***System Software Independent Assessments,***
- ***Systems and Software Engineering Research,***
- ***Software Support for the Office of Safety and Mission Assurance***

2.3 Organization Profile

The NASA Software IV&V Program is an Agency Program established in accordance with NPD 8730.4. The Program is delegated from the Associate Administrator (AA), Office of Safety and Mission Assurance (OSMA) and assigned to the Center Director, GSFC. The Director of the IV&V Facility will serve as the Agency IV&V Program Manager, reporting directly to the GSFC Center Director. IV&V implementation will be tailored to project specific risk characteristics. OSMA will maintain IV&V functional oversight.

An Agency level Board of Directors, chaired by the AA/OSMA and comprised of the Enterprise AAs, Chief Engineer, Chief Information Officer and with the GSFC Center Director and Facility Director as ex officio

members, will determine the funding requirement and allocation of IV&V services among NASA's programs / projects on an annual basis. The Agency IV&V funding requirement will be submitted as part of the OSMA Program Operating Plan (POP) process.

2.4 Background

The NASA IV&V organization's staff has embarked on a process to establish an increased value-added presence within the NASA community. The effort centers around its main purpose of offering needed software services, including independent verification and validation of the critical software under development, independent assessments of software development practices and products, systems engineering support, and software assurance research.

The NASA IV&V Facility in Fairmont, West Virginia, was established in 1993 as part of an agency-wide software strategy to provide the highest achievable levels of safety and cost effectiveness for the mission-critical software of NASA. The NASA IV&V Facility became part of the Goddard Space Flight Center (GSFC) in July 2000. Since becoming a part of GSFC, the NASA IV&V organization has completed an initial Business Plan (June 2000), a subsequent Program Plan, and a NASA Policy Directive (NPD) 8730.4 document (August 2001). These three documents provide the foundation for the strategic planning process.

Strategic planning has long been a value embraced and practiced by NASA. The NASA IV&V organization has historically made planning a critical element of its work. Although an organizational strategic plan, "Mapping a Successful Future" is maintained that encompasses all aspects of the NASA IV&V Facility, this Quality Manual and associated Quality Management System (QMS) is specific to the scope identified in Section 2.2.

Even though the processes and systems identified in our organization's QMS may be used to perform and/or track objectives and activities associated with our organization's strategic plan, only the objectives identified in this Quality Manual are within scope of our organization's QMS. Objectives and activities identified in our organization's strategic plan that are not included in this Quality Manual are not related to the

technical work performed for our organization's customers; they include political and social objectives that our organization believes are important to be an excellent business partner and citizen of the community. All of our organizational objectives and activities associated with providing quality products and services to our NASA technical customers are included in this Quality Manual and associated QMS.

3.0 Quality Policy and Quality Objectives

3.1 Quality Policy

It is the stated quality policy of the NASA IV&V Facility to provide superior quality products and services, through continuous improvement, that meet or exceed customer requirements.

This can only be achieved by operating a comprehensive, coordinated quality management system, which assures the quality of all products, processes, and services offered by the organization. This system is designed to meet the requirements of ISO 9001:2000 and shall be implemented across the whole organization and embrace all of the activities which impact the products and services provided to our customers.

The Director and senior managers of the organization are committed to ensuring that the system is effective in achieving quality and satisfying customers both now and in the future. To this end, we shall strive to continually improve upon our products, processes, and our quality management systems. We shall set quality objectives, which shall be measured against and reported upon. We shall set measurement objectives, collect measures, and analyze them to see that we meet organizational goals. Financial costs associated with these objectives shall be attributed wherever possible.

To foster a culture of continual improvement, the organization shall continue to recognize and reward effective teamwork and individual achievement and shall review its products and processes regularly. We invest in our personnel and emphasis on training acts as a testimony to our commitment in this area.

3.2 Quality Objectives

The quality objectives documented in this Quality Manual and which the QMS has been developed to meet are in agreement with the strategic goals and objectives established and documented in the NASA IV&V Facility Strategic Plan. As mentioned in Section 2.3, the quality objectives identified in this document are related to providing quality products and services to our organization's customers relative to the technical work performed at the Facility.

Processes have been developed and documented to standardize the planning, performance, control, and measurement of technical work. Additional procedures have been developed to enable management to create, maintain, monitor, measure, and improve upon all processes and procedures which make up our organization's Quality Management System (QMS). The relationships between our organization's procedures and the ISO requirements shall be identified and discussed later in this document.

The quality objectives that the NASA IV&V Facility's QMS have been designed to meet are as follows:

1. Perform IV&V/IA services and provide products that meet or exceed our customer's expectation.
2. Enable, perform, and manage research activities that support specific customer research requirements.
3. Support the IV&V/IA technologies and tools to maintain the organizations cutting edge position as a provider.
4. Establish and maintain quality organizational objectives and infrastructure to provide effective operations.
5. Continually improve organizational processes and products.

4.0 Responsibility and Authority

Everyone in the organization has responsibility for the quality of their work, to operate in conformance with the requirements of the Quality System, and stop work in progress or make appropriate notifications when unsafe conditions exist or requirements are not being met, but particular responsibilities are assigned to managers for the effective operation of their departments. Specific responsibilities of employees are:

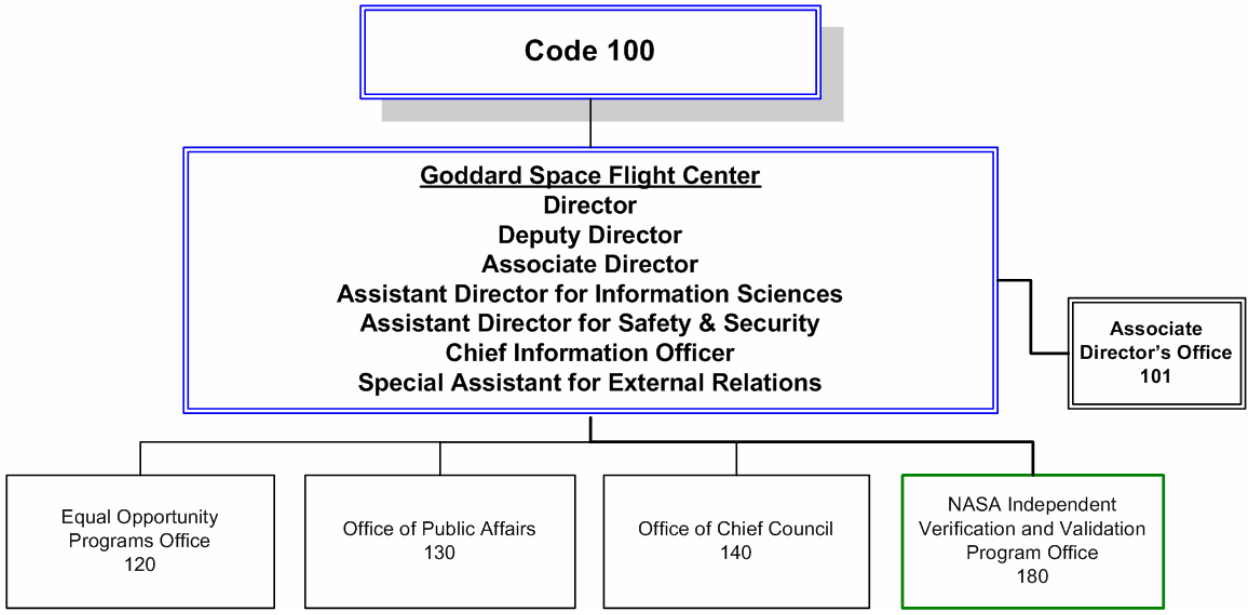
Who	Responsibility and Authority
Director	• Define the Quality Policy • Ensure the communication and understanding of the Quality Policy throughout the organization, and • Appoint a member of our organizations Management Team as the Quality System Management Representative. This appointment shall be documented and the document maintained as a quality record.

QMS Management Representative	• Document and maintain the Quality Policy, • Ensure that the Quality System is established, implemented, and maintained, • Present regular reviews of the suitability and effectiveness of the Quality System to senior management, • Ensure documented procedures define the responsibility, authority, and relationship of all personnel who perform, or verify work affecting quality, • Ensure these documented procedures adequately define the authority and provide for the organizational freedom of personnel to perform assigned responsibilities, • Facilitate continuous improvement to the Quality System, and • Ensure metrics are developed, tracked, and reported as required by our organizational management to assess the performance of the Quality Management System.
Deputy Director	• Ensure that an adequate number of qualified, skilled, and trained personnel and other resources are available to implement the Quality System, and • Ensure that personnel comply with applicable standards, regulations, specifications, and documented procedures.
Project Managers	• Obtain and communicate customer requirements to the appropriate personnel or functional organization and • Ensure that products and services satisfy customer requirements including quality, safety, cost, schedule, performance, reliability, durability, accuracy, and maintainability.

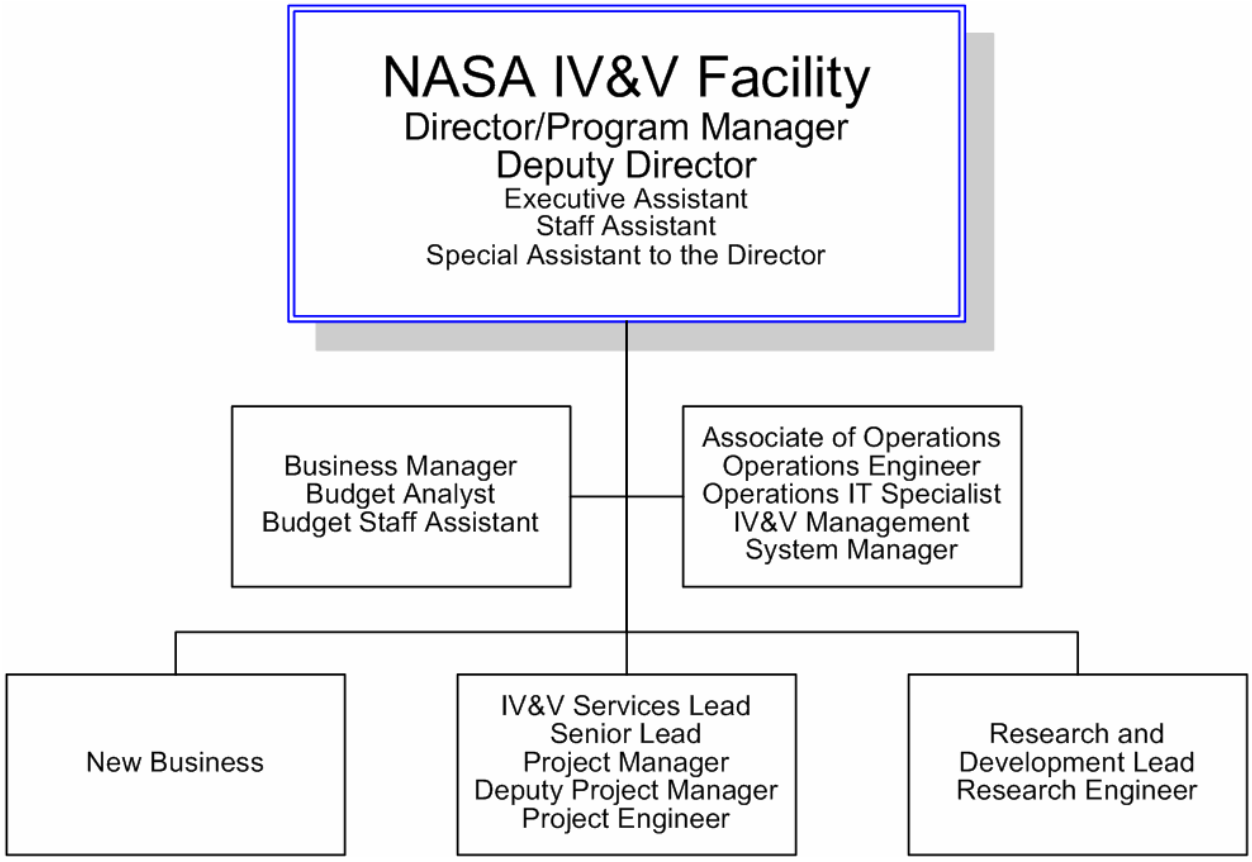
5.0 Organizational Charts

Three organizational charts are presented in this section. The first chart shown in Section 5.1 depicts how the NASA IV&V Facility is managerially attached to Goddard Space Flight Center (GSFC). Note that the IV&V Facility Director is the IV&V Program Manager within Code 100, reporting directly to the GSFC Center Director. The second chart shown in Section 5.2 is the official management organizational chart of the NASA IV&V Facility. The third chart shown in Section 5.3 depicts how activities related to our organization's QMS flow and are managed. It does not modify and change the actual management or supervisory roles and responsibilities depicted in the official management organization charts.

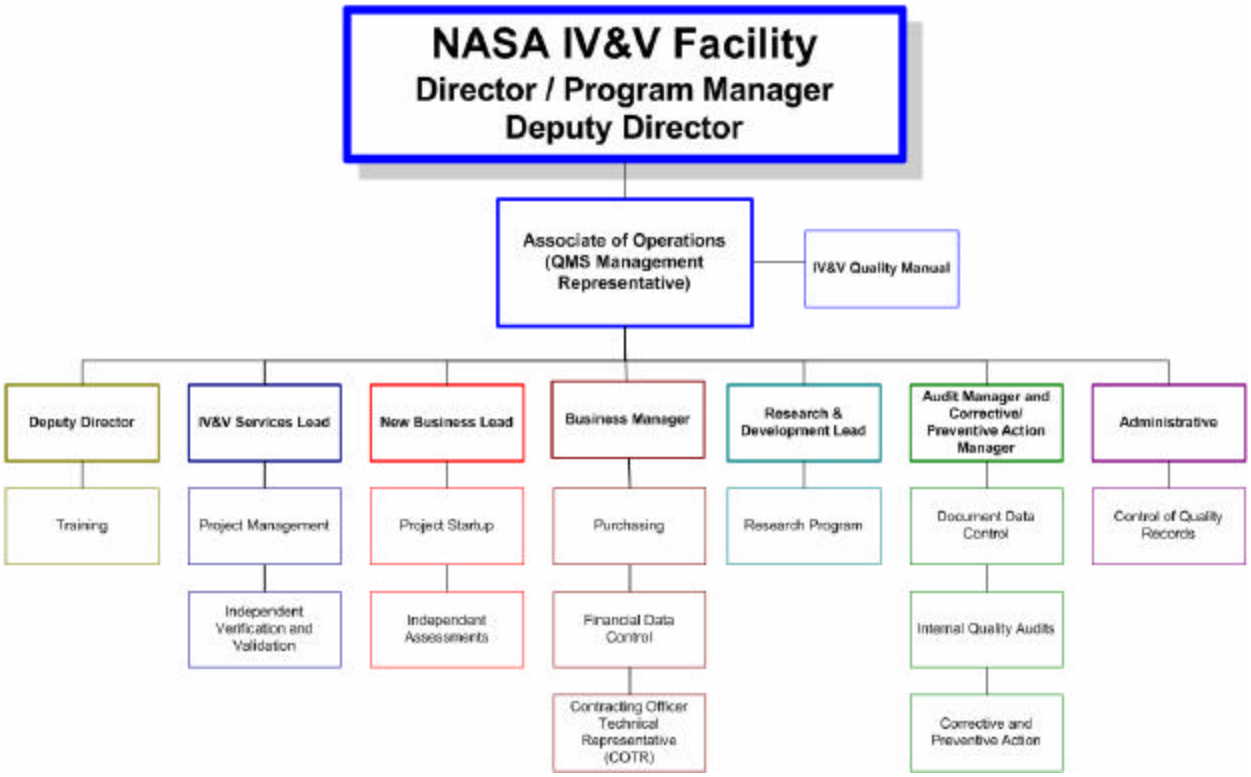
5.1 Code 100 Organizational Chart



5.2 Management Organizational Chart



5.3 QMS Functional Organizational Chart



6.0 Quality Management System

This manual forms one part of a three tier quality system: Quality Manual, System Level Procedures, and Work Instructions.

Quality Manual	This document outlines our organization's policies and procedures regarding the requirements of ISO 9001 (This document).
System Level Procedures	These documents define the processes operated by the NASA IV&V Facility to satisfy customer needs and to address the requirements of ISO 9001. The chart in Section 7.0 identifies which SLPs accommodate which ISO requirements.
Work Instructions	These are rarely required, but when necessary shall be made available at the point of use for staff to refer to where training provided does not adequately address the needs of the process being undertaken or where reference is necessary to ensure the consistency of production or service.

7.0 Process Coverage

			IV&V ISO QMS System Level Procedure or Work Instruction																							Forms		
			QM	5	5-1	5-2	5-3	6	7	8	9-1	9-2	9-3	9-3-1	9-3-2	9-3-3	9-3-4	9-3-5	9-3-6	9-3-7	9-4	9-8	14	16	17	18	1000	1005	1007
ANSI/ISO/ASQ Q9001:2000 Section	4.0	Quality Management System	TITLE ONLY																									
	4.1	General Requirements	X																									
	4.2	Documentation Requirements	TITLE ONLY																									
	4.2.1	General	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	4.2.2	Quality Manual	X																									
	4.2.3	Control of Documents	X	X																						X	X	X
	4.2.4	Control of Records	X		X				X															X		X	X	X
	5.0	Management Responsibility	TITLE ONLY																									
	5.1	Management Commitment	X																									
	5.2	Customer Focus	X																		X							
	5.3	Quality Policy	X																									
	5.4	Planning	TITLE ONLY																									
	5.4.1	Quality Objectives	X																									
	5.4.2	Quality Management System Planning		X	X	X	X																	X		X	X	X
	5.5	Responsibility, Authority, and Communication	TITLE ONLY																									
	5.5.1	Responsibility and Authority	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
	5.5.2	Management Representative	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
	5.5.3	Internal Communication	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	5.6	Management Review	TITLE ONLY																									
	5.6.1	General	X																				X		X		X	
	5.6.2	Review Input	X																				X		X		X	
	5.6.3	Review Output	X																				X		X			
	6.0	Resource Management	TITLE ONLY																									
	6.1	Provision of Resources	X																						X			
	6.2	Human Resources	TITLE ONLY																									
	6.2.1	General	X																						X			
	6.2.2	Competency, Awareness, and Training	X																						X			
	6.2.3	Infrastructure	Out Sourced to West Virginia University																									
	6.2.4	Work Environment	Out Sourced to West Virginia University																									
	7.0	Product Realization	TITLE ONLY																									
	7.1	Planning of Product Realization	X								X	X									X	X						
	7.2	Customer Related Process	TITLE ONLY																									
	7.2.1	Determination of Requirements Related to the Product									X	X																
	7.2.2	Review of Requirements Related to the Product									X	X										X						
	7.2.3	Customer Communication	X								X	X									X	X						
	7.3	Design and Development	TITLE ONLY																									
	7.3.1	Design and Development Planning									X	X																
	7.3.2	Design and Development Inputs									X	X																
	7.3.3	Design and Development Outputs									X	X																
	7.3.4	Design and Development Review									X	X																
	7.3.5	Design and Development Verification									X	X																
	7.3.6	Design and Devleopment Validation									X	X																
	7.3.7	Control of Design and Development Changes									X	X																
	7.4	Purchasing	TITLE ONLY																									
	7.4.1	Purchasing Process						X																				
	7.4.2	Purchasing Information						X																				
	7.4.3	Verification of Purchased Product						X																				
	7.5	Product and Service Provision	TITLE ONLY																									
	7.5.1	Control of Production and Service Provision											X	X	X	X	X	X	X	X								X
	7.5.2	Validation of Process for Production and Service Provision											X	X	X	X	X	X	X	X								X
	7.5.3	Identification and Traceability											X	X	X	X	X	X	X	X								X
	7.5.4	Customer Property											X	X	X	X	X	X	X	X								
	7.5.5	Preservation of Product											X	X	X	X	X	X	X	X								
	7.6	Control of Monitoring and Measuring Devices	X										X	X	X	X	X	X	X	X								X
	8.0	Measurement, Analysis, and Improvement	TITLE ONLY																									
	8.1	General	X																				X		X			
	8.2	Monitoring and Measurement	TITLE ONLY																									
	8.2.1	Customer Satisfaction																						X				
	8.2.2	Internal Audit																						X				
	8.2.3	Monitoring and Measurement of Processes																					X		X	X	X	
	8.2.4	Monitoring and Measurement of Product																					X		X			X
	8.3	Control of Non-conforming Product	X																		X							
	8.4	Analysis of Data	X																		X							
	8.5	Improvement	TITLE ONLY																									
	8.5.1	Continual Improvement	X	X		X	X						X										X			X	X	
	8.5.2	Corrective Action										X											X			X	X	
	8.5.3	Preventive Action																					X			X	X	

8.0 Documentation

8.1 Quality Manual

This document outlines our organization's policies and procedures regarding the requirements of ISO 9001 and is one part of a three tier quality system: Quality Manual, System Level Procedures, and Work Instructions (see Section 6 of this document for details).

8.2 Control of Documents

All documents, which are regarded as part of the quality management system (e.g. Quality Manual, procedures, standards, and drawings) shall be formally controlled to ensure that:

- documents are reviewed and approved both prior to issue and when changes are made,
- document revision status is clearly identifiable,
- documents are available at the point of use,
- documents remain legible, readily identifiable, and retrievable, and
- obsolete documents are either destroyed or identified to prevent their inadvertent use.

These controls will also be applied to documents from outside sources where required (see IVV 05, Document and Data Control for details).

8.3 Control of Quality Records

Any relevant records which are generated as a result of using the quality management system shall be regarded as quality records. They shall be retained to provide evidence of the effective operation of the system. All quality records shall be identified and stored for a defined period of time in conditions that protect them from damage, deterioration, loss, and allow them to be retrieved as appropriate. When the retention period has been reached, the documents shall be disposed of in a defined manner (e.g. incinerated, shredded, or recycled).

These controls shall be applied to all quality records whether they are on paper or electronic media. Where records are retained on computer,

those records shall be protected from access through security mechanisms and shall be subject to regular backing up on storage media (see IVV 16, Control of Quality Records for details).

9.0 Management Responsibility

9.1 Management Commitment and Customer Focus

The Director and senior managers of this organization are committed to ensuring that customers will receive products and services, which shall meet their needs and, wherever possible, exceed their expectations. Through the development and continual improvement of our quality management system we will ensure that the latest regulatory and legal requirements relating to our products and services are understood and applied wherever necessary (see IVV 09-4, Project Management, section 6.6.5).

9.2 Quality Planning

Through our quality management system we ensure that all operations, which affect quality, are planned and organized to ensure that quality is achieved. Business and quality objectives are set at strategic and tactical levels within the organization and are measured regularly

Our organization's objectives are reviewed annually by the Strategic/Tactical planning efforts. These reviews include the Quality System Objectives, and a review of the integrity of the QMS as an operating management system.

9.3 Responsibility and Authority

General responsibilities and authorities are outlined in Section 4 of this manual; more detail is contained within the documented procedures, which support the manual.

9.4 Internal Communication

Communication between departments is regarded as a vital element in ensuring that we achieve customer satisfaction. This is especially so on our tailored systems, which will normally involve most departments in the organization. We have installed paper-based and computer-based systems, which ensure that the right information is available to the right personnel where and when they need it. In addition, we hold regular meetings at various levels to ensure that this information is accurate and up to date.

9.5 Management Review

The Director and senior managers of the organization review the Quality Management System on a quarterly basis to determine its suitability, adequacy, and effectiveness. Consideration is given at this meeting to a range of items as detailed in the agenda and includes our performance at meeting the needs of the business, its customers, and any opportunities for the continual improvements of the system.

The Quarterly Management Review shall cover an overall management system effectiveness statement, the Corrective/Preventive Action Program, and the Internal Assessment Audit Program. The Corrective and Preventive Action Manager shall provide the status of the requests according to SLP IVV 14 and the audit manager shall provide the status of audits according to the SLP IVV 17. The QMR shall be open to all affected Facility employees.

The NASA IV&V Facility is committed to the effective operation of its business and, therefore, all actions arising from these meetings are assigned to members of the management team with prescribed deadlines for resolution and reporting back.

Also, other meetings are held throughout the year, which consider elements of our quality system, which may be referred to during the review meeting.

The recorded minutes of each review meeting are signed, dated, and retained (see section 8.3 and IVV 14 and 17 for details).

9.5.1 Review of Input

The input to management review includes results of audits, customer feedback, process performance and product conformity, status of preventive and corrective actions, follow-up actions from previous management reviews, changes that could affect the quality management system, and recommendations for improvement of the system.

9.5.2 Review of Output

The output from the management review includes any decisions and actions related to improvement of the effectiveness of the quality management system and its processes, improvement of product(s) related to customer requirements, and resource needs.

10.0 Resource Management

10.1 Provisions of Resources

The NASA IV&V Facility ensures that there is an adequate number of suitable personnel, equipment, and any other resources available to effectively manage and perform all activities required to achieve customer satisfaction (see IVV 18 for details).

10.2 Competency, Awareness, and Training

Competent managers and personnel are appointed to perform their assigned tasks and will possess the ability to resolve any problems either directly or through their 'line manager'. Much of the work that we perform involves a large element of practical skill and so many of the personnel are selected because of their ability to apply these skills rather than their formal qualifications. Personnel are generally selected for their overall competence to perform their work, but are also considered for their education, training, skills, and experience (see IVV 18 for details).

All personnel who perform tasks affecting quality shall be made aware of the importance of their work and how it affects their overall quality of the products and services provided by the NASA IV&V Facility.

The competency of personnel shall be assessed and any requirements for training identified and provided. All training shall be evaluated to ensure that it has been effective. Records of training, education, and qualifications shall be retained (see IVV 18, Training for details).

10.3 Infrastructure and Work Environment

In order to ensure that we can assure product conformity and satisfaction for our customers, we will provide the necessary workspace, equipment, tools, environment, and materials. The NASA IV&V Facility takes all available precautions to ensure that the quality of our work is not compromised by external factors. Our work environment shall be configured to address any, and all, foreseeable conformity issues.

11.0 Product Realization

11.1 Planning of Product Realization

The NASA IV&V Facility has identified its main business processes and generated specific SLPs for each process in order to ensure conformance of product and customer satisfaction. These processes have been defined and documented through procedures, which form part of the overall quality management system of the organization. In addition, each project shall be accompanied by the appropriate task orders or project plans, which shall contain the necessary criteria for acceptability and/or objectives for quality to ensure satisfactory control. Whenever necessary, individual quality plans shall be developed for specific products, projects, or contracts which shall describe particular controls for these situations (see IVV 9-4 and IVV 9-8 for details).

11.2 Customer Related Processes

Customer requirements normally require some tailoring of activities and/or special arrangements regarding personnel, tools, or systems. The NASA IV&V Facility shall ensure that the customer's requirements are

established and documented. Any requirements that our trained staff identify as necessary to perform the task(s) shall also be noted and related back to the customer as appropriate. All work to be performed for a customer shall be documented and agreed upon by both parties. A Memorandum of Agreement (MOA) serves as the appropriate documentation.

Requirements shall be reviewed for accuracy and completeness to ensure that we can satisfy the requirements before formally accepting the task. Where there are ambiguous or conflicting requirements, they shall be clarified with the customer prior to the formal acceptance of the task(s), which shall be recorded (see IVV 9-4 for details).

11.3 Customer Communication

We regard communication with our customer as a vital ingredient in providing services and products which satisfy them. As such, our internal system provides all departments with the necessary mechanisms to easily access information. The PM assigned to a project shall act as the main point of contact for customer inquires (see IVV 9-4 and IVV 9-8 for details).

11.4 Design and Development

Because the NASA IV&V Facility does not design and build major systems, but evaluates and analyzes others that are designing and developing systems for NASA, our approach to design and development is unique. When Independent Verification and Validation (IV&V) or Independent Assessment (IA) activities for a customer include design analysis, organizational personnel will ensure that the necessary design activities are being performed per NASA and/or customer requirements. The results of our evaluation and analysis is documented and provided to the development and management organizations and our customer (see IVV 09-1, Independent Verification and Validation for details).

11.5 Purchasing

Purchase of products and services for use in or on our products is controlled through strict government rules and regulations. Ordering is based on the need for improved products and services.

Sequentially numbered purchase orders complete with all the necessary information for the products/service required are used to order the good/service and are reviewed for adequacy prior to their release.

Wherever possible, orders are only placed with approved suppliers. There is a defined procedure for the approval and monitoring of suppliers with records being kept of their status and any evaluations performed.

The verification of purchased products is defined in the Purchasing procedure. If our customers or ourselves need to verify products at the supplier's premises, this shall be detailed in the purchase order (see IVV 06, Purchasing, for details).

11.6 Deliver and Service Provision

Delivery of our IV&V/IA products (documentation containing an analysis of the customers design product) are via an internal peer review process to ensure its adequacy, accuracy, and conformance to our standards (see IVV 09-4, Project Management, for details).

Special handling and servicing of our products is not applicable.

All products can be traced to the specific customer product which was reviewed by part numbers and documentation.

11.7 Measuring and Monitoring Devices

With software being used to perform measuring and monitoring activities, it shall be validated for accuracy and suitability prior to use. Other measuring devices, Metrology, is N/A. Our analytical product is a document containing our evaluation of a customer's development process, and product. The use of measuring devices in the classical sense is not applicable. Our analytical product is measured by 8.3 and 8.4 (see sections 12.2, 12.3, and IVV 9-4 for details).

12.0 Measurement, Analysis, and Improvement

Measuring and monitoring activities shall be used throughout the organization to ensure that we achieve product conformity, customer satisfaction and are able to improve the quality management system and our products and services. Where appropriate, we shall employ statistical techniques and other methodologies, which will enable us to gather and analyze data and information for these purposes (see IVV 14 and 17 for details).

12.1 Measurement and Monitoring

Customer perception is regarded as one of the most important aspect of our business. As such, we shall measure and monitor the degree of customer satisfaction via various methods including customer surveys, formal face-to-face customer exchanges known as Quarterly Executive Dialogs (QEDs) and informal customer dialogue. Whenever issues are received from customers, they shall be recorded, analyzed and acted upon. A summary and analysis of customer issues shall be presented for review at the management review meetings, which are held periodically.

Internal quality audits shall be performed periodically to ensure that our quality management system continues to conform to ISO 9001:2000 and that we are working in compliance with the system and ensuring that the system has been fully implemented and that it effectively assists us with our quality objectives. Personnel who are suitably trained and who do not perform the activity to be audited shall perform audits in accordance with a documented procedure. Audits shall be scheduled to ensure that the whole of the system is addressed at least annually and shall take

accounts of the importance of each activity and its status with regard to previous audit results (see IVV 17, Internal Quality Audits for details).

In order to ensure conformity of product, we shall measure and monitor both products and the processes used to create them. Products go through both informal peer reviews and formal management reviews. Records of these checks shall be maintained to provide evidence of conformity with requirements. Where installation work is performed the customer shall always be asked to accept the work prior to completing the project.

12.2 Control of Non-conforming Products

Where products do not conform to requirements, they shall be handled in a manner which will ensure that they can not be used inadvertently. Defined methods for controlling non-conforming products are contained within other documented procedures and may include (see IVV 9-4 for details):

- accepting with concession from customers,
- reworking and re-inspection,
- re-grading, and
- scrap.

12.3 Analysis of Data

We shall gather data in specific areas and analyze it to help us understand where improvements can be made and how the system is working. These areas shall include customer feedback, internal audits, inspections, results, product and process non-conformance, and supplier information (see IVV 9-4 for details).

12.4 Improvement

In order to better satisfy customers and become more successful as a business we shall strive to continually improve our quality management systems, products, and processes. Our main tools for achieving this shall be our quality policy and objectives, management review meetings, internal audits, self-assessments, analysis of data, and corrective and preventive actions. Where improvements are identified they shall be implemented and monitored as to their effectiveness.

Defined methods for taking corrective and preventive actions are contained within many of our documented procedures. These methods ensure that these actions are properly identified and recorded to allow us to determine the root cause of the problem encountered. From this we can take appropriate action, which ensures that the problem is resolved and does not reoccur. In addition, we shall use the information gathered to help prevent potential problems from arising elsewhere in the business. All such actions taken shall be reviewed for effectiveness either as a specific activity or during future internal audits (see IVV 14 for details).

In addition, we recognize the importance of our suppliers in achieving customer satisfaction. Thus, we provide informal feedback on their performance as well as communicate improvement data to them on a regular basis via QEDs.

APPENDIX

A. System Level Procedures

See the ISO Documentation Master List.

B. Work Instructions

See the ISO Documentation Master List.